

### Office Action Summary

**Application No.**

10/516,937

**Applicant(s)**

MURAKAMI ET AL.

**Examiner**

BRANDON J. MILLER

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16, 18-21, 23, 24 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16, 18-21, 23, 24 and 26-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

I. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. Claims 16, 18-21, 23-24, and 26-31 remain pending in the application.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

II. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 recites "wherein the frame configuration determination section selects one of a frame configuration for transmitting a modulated signal... and a frame configuration for transmitting a plurality of different modulated signals...and, selects one of a frame configuration for transmitting a modulated signal for a second terminal...and a frame configuration for transmitting a plurality of different modulated signal for the second terminal" in lines 8-17. This limitation is unclear because it does not adequately distinguish between the various frame configurations available for selection. The limitations render the claim indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following art rejection is based on the best possible interpretation of the claim language in light of the rejection under 35 U.S.C. 112, second paragraph.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

III. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

IV. Claims 16, 18-21, 23-24, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hadad (US 7,224,741 B1) in view of Asano (US 6,941,113 B2).

Regarding claim 16 Hadad teaches a transmission method for transmitting an orthogonal frequency division multiplexing signal (see col. 4, lines 36-41 and col. 5, lines 6-8). Hadad teaches composing, on a per unit time basis, a plurality of carrier groups each composed of one or more subcarriers (see col. 5, lines 59-64). Hadad teaches assigning, on a per unit time basis, transmission data for a plurality of transmission destination terminals, to the plurality of carrier groups; and transmitting the assigned transmission data (see col. 4, lines 31-42 & 45-48, carrier groups are arranged for each subsequent terminal (see col. 6, lines 10-11)). Hadad does not specifically teach selecting, for each of the carrier groups one a per unit time basis, one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where the transmission data is transmitted using a plurality of modulated signals. Asano teaches selecting one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where the transmission data is transmitted using another modulated signal (see col. 7, lines 29-36 & 41-54 and col. 8, lines 15-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the transmission method in Hadad adapt to include selecting, for each of the carrier groups one a per unit time basis, one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where the transmission data is transmitted using a plurality of modulated signals because Asano teaches that data can be transmitted according to one

modulation technique or another and incorporating that teaching in Hadad would allow for the carrier groups in Hadad to be modulated in a way that would further reduce interference.

Regarding claim 18 Hadad teaches wherein the transmission data is assigned based on channel state information from the transmission destination terminals (see col. 4, lines 36-38 and col. 6, lines 59-60).

Regarding claim 19 Hadad transmitting, at a first time, a modulated signal for a first terminal on a first carrier group and a modulated signal for a second terminal on a second carrier group (see col. 6, lines 61-67 and col. 7, lines 1-6, each subscriber indicates that there are multiple terminals and this sub carrier allocation will allow the modulated signals to be transmitted (see col. 4, lines col. 4, lines 31-42 & 45-48)). Hadad teaches transmitting, at a second time, a modulated signal for a third terminal on the first carrier group and a modulated signal for a fourth terminal on the second carrier group (see col. 7, lines 7-8, assigning several subscribers the same code indicates that at least some of the subscribers will have the same carrier groups and this sub carrier allocation will allow the modulated signals to be transmitted (see col. 4, lines col. 4, lines 31-42 & 45-48)).

Regarding claim 20 Hadad teaches wherein third and fourth terminals are selected from the first and second terminals (see col. 7, lines 7-8, assigning several subscribers the same code indicates that at least some of the subscribers will have the same carrier groups and this sub carrier allocation will allow the modulated signals to be transmitted (see col. 4, lines col. 4, lines 31-42 & 45-48)).

Regarding claim 21 Hadad teaches a transmission method for transmitting an orthogonal frequency division multiplexing signal (see col. 4, lines 36-41 and col. 5, lines 6-8). Hadad

teaches configuring a transmission frame including a first carrier group where a modulated signal for a first terminal is arranged and a second carrier group where a modulated signal for a second terminal is arranged (see col. 4, lines 31-42 & 45-48, cellular transmitter/receiver configures transmission frame and carrier groups are arranged for each subsequent terminal (see col. 6, lines 10-11)). Hadad does not specifically teach selecting, for the first carrier group, one of a first frame configuration where one modulated signal is transmitted, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas; and selecting, for the second carrier group, one of the first frame configuration where one modulated signal is transmitted, and a second frame configuration where a plurality of modulated signals are transmitted from the plurality of antennas, each of the plurality of modulated signals being transmitted from a different antenna. Asano teaches selecting, for the carrier groups, one of the first frame configuration where one modulated signal is transmitted, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas, each of the plurality of modulated signals being transmitted from a different antenna (see col. 7, lines 29-36 & 41-54, col. 8, lines 15-19, and FIGS. 3A-3D). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the transmission method in Hadad adapt to include selecting, for a first and second carrier group, one of the first frame configuration where one modulated signal is transmitted, and a second frame configuration where a plurality of modulated signals are transmitted from the plurality of antennas, each of the plurality of modulated signals being transmitted from a different antenna because Asano teaches that data can be transmitted according to one modulation technique or another and incorporating

that teaching in Hadad would allow for the carrier groups in Hadad to be modulated in a way that would further reduce interference.

Regarding claim 23 Hadad teaches a device as recited in claim 18 and is rejected given the same reasoning as above.

Regarding claim 24 Hadad a transmission apparatus comprising an orthogonal frequency division multiplexing signal generation section that generates an orthogonal frequency division multiplexing signal (see col. 4, lines 26-30 & 36-41 and col. 5, lines 6-8, transmitter reads on signal generator). Hadad teaches a frame configuration determination section that determines a modulated signal to be assigned to a carrier of the orthogonal frequency division multiplexing signal (see col. 4, lines col. 4, lines 26-42 & 45-48, cellular transmitter/receiver configures transmission frame). Hadad teaches composing on a per unit time basis, a plurality of carrier groups each composed of one or more subcarriers (see col. 5, lines 59-64), and, assigns, on a per unit time basis, transmission data for a plurality of transmission destination terminals, to the plurality of composed carrier groups (see col. 4, lines 31-42 & 45-48, carrier groups are arranged for each subsequent terminal (see col. 6, lines 10-11)). Hadad does not specifically teach selecting, for each of the carrier groups one a per unit time basis, one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas. Asano teaches selecting one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas (see col. 7, lines 29-36 & 41-54, col. 8, lines 15-19, and FIGS. 3A-3D). It would have been obvious to one

of ordinary skill in the art at the time the invention was made to make the transmission method in Hadad adapt to include selecting, for each of the carrier groups one a per unit time basis, one of a first frame configuration where the transmission data is transmitted using one modulated signal, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas because Asano teaches that data can be transmitted according to one modulation technique or another and incorporating that teaching in Hadad would allow for the carrier groups in Hadad to be modulated in a way that would further reduce interference.

Regarding claim 26 Hadad teaches a device as recited in claim 18 and is rejected given the same reasoning as above.

Regarding claim 27 Hadad a transmission apparatus wherein, at a first unit of time, assigning a modulated signal for a first terminal on a first carrier group and assigning a modulated signal for a second terminal on a second carrier group (see col. 6, lines 61-67 and col. 7, lines 1-6, each subscriber indicates that there are multiple terminals and this sub carrier allocation will allow the modulated signals to be transmitted (see col. 4, lines col. 4, lines 31-42 & 45-48)). Hadad teaches at a second unit of time, assigning a modulated signal for a third terminal on the first carrier group and assigning a modulated signal for a fourth terminal on the second carrier group (see col. 7, lines 7-8, assigning several subscribers the same code indicates that at least some of the subscribers will have the same carrier groups).

Regarding claim 28 Hadad teaches a device as recited in claim 20 and is rejected given the same reasoning as above.

Regarding claim 29 Hadad a transmission apparatus comprising an orthogonal frequency division multiplexing signal generation section that generates an orthogonal frequency division



multiplexing signal (see col. 4, lines 26-30 & 36-41 and col. 5, lines 6-8, transmitter reads on signal generator). Hadad teaches a frame configuration determination section that determines a modulated signal to be assigned to a carrier of the orthogonal frequency division multiplexing signal (see col. 4, lines col. 4, lines 26-42 & 45-48, cellular transmitter/receiver configures transmission frame). Hadad teaches a plurality of antennas (see col. 3, lines 25-30 and FIGs. 1 & 2, cellular wireless system contains a plurality of antennas). Hadad does not specifically teach selecting a frame configuration for transmitting a modulated signal for the first terminal on the first carrier group and a frame configuration for transmitting a plurality of different modulated signals for the first terminal on the first carrier group from different antennas, and selects one of a frame configuration for transmitting a modulated signal for a second terminal on a second carrier group and a frame configuration for transmitting a plurality of different modulated signals for the second terminal on the second carrier group from different antennas. Asano teaches selecting, for the carrier groups, one of the first frame configuration where one modulated signal is transmitted, and a second frame configuration where a plurality of modulated signals are transmitted from a plurality of antennas, each of the plurality of modulated signals being transmitted from a different antenna (see col. 7, lines 29-36 & 41-54, col. 8, lines 15-19, and FIGS. 3A-3D). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the transmission method in Hadad adapt to include selecting a frame configuration for transmitting a modulated signal for the first terminal on the first carrier group and a frame configuration for transmitting a plurality of different modulated signals for the first terminal on the first carrier group from different antennas, and selects one of a frame configuration for transmitting a modulated signal for a second terminal on a second carrier group

and a frame configuration for transmitting a plurality of different modulated signals for the second terminal on the second carrier group from different antennas because Asano teaches that data can be transmitted according to one modulation technique or another and incorporating that teaching in Hadad would allow for the carrier groups in Hadad to be modulated in a way that would further reduce interference.

Regarding claim 30 Hadad teaches a device as recited in claim 22 and is rejected given the same reasoning as above.

Regarding claim 31 Hadad teaches a device as recited in claim 18 and is rejected given the same reasoning as above.

### ***Response to Arguments***

V. Applicant's arguments with respect to claims 16, 18-21, 23-24, and 26-31 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

VI. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Murakami et al. Pub. No.: US 2004/0213144 A1 discloses a radio communications apparatus and radio communications method.

Murakami et al. Patent No.: US 7,023,933 B2 discloses a radio communication apparatus.

Murakami et al. Patent No. US 6,993,092 B1 discloses a transmission apparatus, reception apparatus and digital radio communication method.

Murakami et al. Patent No. US 7,069,489 B2 discloses a transmission apparatus, reception apparatus, transmission method, and reception method.

VII. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **BRANDON J. MILLER** whose telephone number is (571)272-7869. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on 571-272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Eng/  
Supervisory Patent Examiner, Art Unit 2617

June 24, 2008

/Brandon J Miller/  
Examiner, Art Unit 2617